

# Product Overview: Water

# Content

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>Water consumption</b>	<b>5</b>
2.1	Water abstraction	5
2.2	Household water use	7
<b>3</b>	<b>Identified savings potential</b>	<b>9</b>
3.1	Overall savings potential	9
3.2	Domestic sector – the potential for saving	9
3.2	Commercial and industrial water sectors	11
<b>4</b>	<b>Next steps</b>	<b>12</b>
4.1	Priority policies	12
4.2	Extending MTP coverage	12

# 1 Introduction

The Market Transformation Programme (MTP), operating through a Lead Contract to Defra, supports UK Government policy on sustainable products. Product policy is an important aspect of sustainable consumption and production<sup>1</sup>, contributing to the UK's Sustainable Development Strategy<sup>2</sup>.

MTP's aim is to reduce the whole life environmental impacts of products, through better eco-design. The approach is to communicate and interpret government policy objectives as a set of specific action plans, or roadmaps, looking ahead at least ten years, and to get buy in from policy makers and from industry at UK, EU and International levels. The Programme also supports policy delivery, in particular, by developing corresponding product eco-design information (labels) and performance requirements (standards) to encourage innovation and competition. The current focus of the programme is on products which use large amounts of energy and water and other products which are responsible for significant volumes of problematic waste.

This is one of a set of three papers (water, energy and waste), which aim to summarise the work the MTP is currently doing in relation to the environmental performance of products to effect a change in water usage in the period 2010 – 2020. This paper focuses on the in-use water consumption of products currently covered by MTP. The paper describes the current evidence developed by MTP on the relevant products, gives an indication of the savings potential (where possible) and puts forward suggestions for possible future work to help reduce the environmental impact of products.

More detailed information on particular aspects and products is available in Policy Briefs, Briefing Notes and other reports from the MTP web site ([www.mtprog.com](http://www.mtprog.com)). The references in this paper will direct you to key documents.

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<sup>1</sup> [www.defra.gov.uk/environment/business/scp](http://www.defra.gov.uk/environment/business/scp)

<sup>2</sup> [www.sustainable-development.gov.uk](http://www.sustainable-development.gov.uk)

### **Market transformation scenarios**

MTP uses market information to project the future environmental impact of products (currently to 2020). MTP then consults with stakeholders on measures that would help to mitigate or prevent these impacts, eg the use of labelling schemes, regulation, procurement initiatives or innovation. Three standard scenarios<sup>3</sup> are developed to illustrate the potential impacts of these market transformation strategies:

**Reference scenario (Ref):** A projection of what will happen without any new policy intervention. This is based on current trends, technology developments and policies that are already in place, but assumes no new policies.

**Earliest Best Practice scenario (EBP):** A projection of what would happen if everyone started buying the best available products, manufacturers put the best known technologies on the market in a fairly rapid timescale, and Government took all reasonable (but ambitious) policy steps to mitigate adverse environmental impacts. An ideal scenario for environmental point of view – but usually not realisable.

**Policy scenario (Pol):** This estimates what could be achieved through an ambitious but feasible set of policy measures if the agreement of all stakeholders was obtained.

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<sup>3</sup> See also: [BNXS02](#) -Definition of Scenario Types used in MTP Policy Briefs.

## 2 Water consumption

### 2.1 Water abstraction

Generally the UK has adequate water resources for its needs, however there are regional areas of stress, and prolonged periods of low rainfall can put resources under pressure. Water abstracted for use in the UK comes from two main sources, namely surface water and groundwater.

Data is collated on water abstraction in England and Wales by the Environment Agency. This is historical data and is further divided in various end user sectors, such as:

- public water supply;
- electricity supply industry;
- fish farming; and
- other industry.

Public water supply currently accounts for a high percentage of the overall water abstraction volumes, with values between 38 and 52% (table 2.1 and figure 2.1),

Any increase in the use of water for public supply will directly impact on abstraction requirements and this has implications for the environment and the ecology that is dependent on that water. On a regional basis, new housing development, especially in the south-east of England, will increase pressure on already overstretched local water resources. Furthermore, water for public supply consumes energy and chemicals in treatment prior to supply and for the treatment of wastewater. Hot water requires energy input for heating and water heating is now the largest energy use in new highly insulated homes<sup>4</sup>.

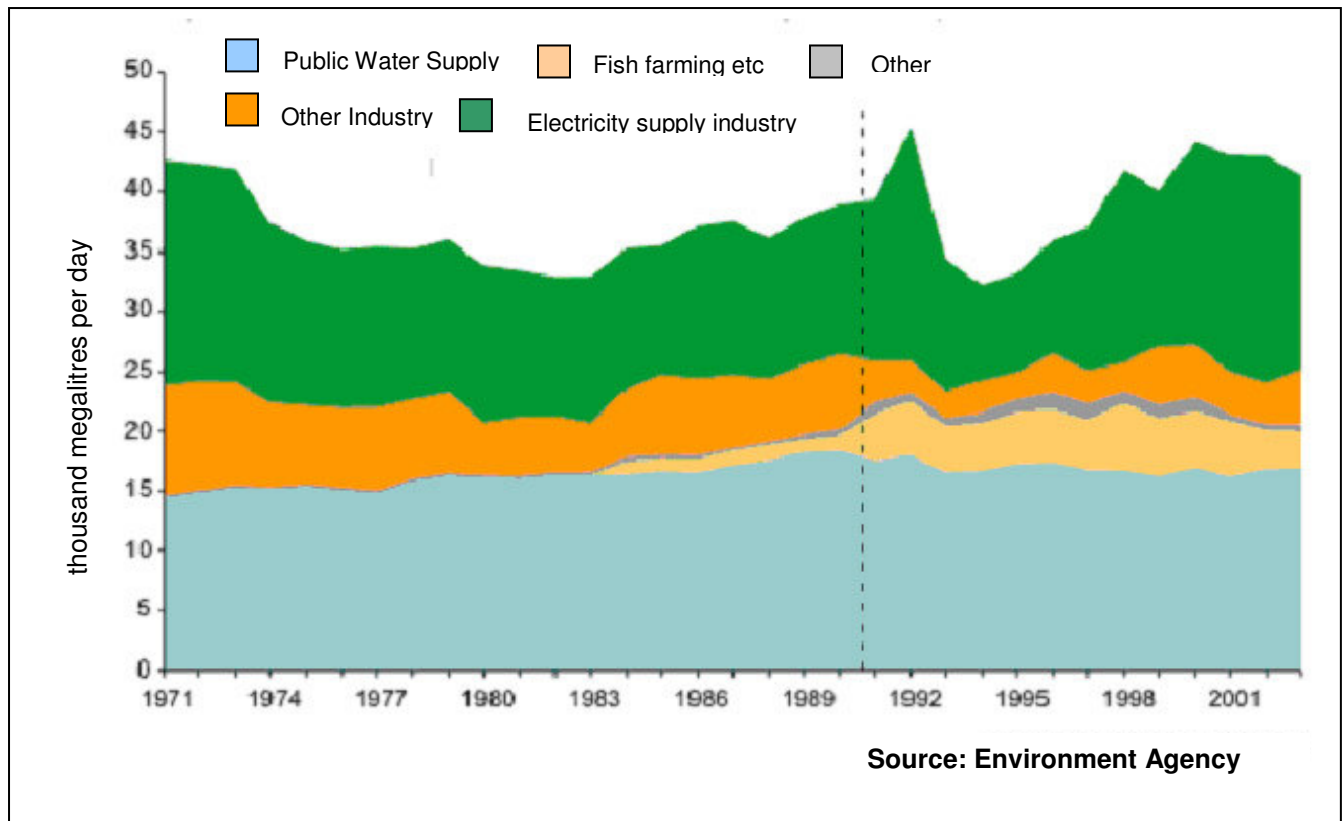
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<sup>4</sup> Energy use of domestic water consumption: A family of four can use 220,000 litres of water a year. This requires 120 kWh of energy to supply the water and 100 kWh to treat it as sewerage, producing 200 kg of CO<sub>2</sub> (carbon dioxide, a greenhouse gas). An additional 730kg of CO<sub>2</sub> is produced as a result of heating the water (based on 30% of water supplied being heated with gas as the energy source)

**Table 2.1 Water abstraction – England and Wales (in thousand Megalitres/day)**

	1991	1995	2000	2001	2002	2003
Electricity supply industry	13.4	8.2	16.9	18.1	19.0	16.1
Other industry	3.5	2.3	4.4	3.6	3.4	4.6
Other purposes	1.0	1.0	1.1	0.6	0.5	0.6
Fish farming etc	3.9	4.3	4.7	4.7	3.2	3.1
Public water supply	17.6	17.3	17.00	16.2	16.9	16.9
<b>Total</b>	<b>39.3</b>	<b>33.2</b>	<b>44.1</b>	<b>43.1</b>	<b>43.1</b>	<b>41.4</b>

**Figure 2.1 Abstractions from non-tidal surface water and groundwater by use: England and Wales, 1971- 2003**



## 2.2 Household water use

Household water usage makes up 38% of the total water supplied in England and Wales<sup>5</sup>. Average per capita consumption is now approximately 150 litres per day, with an average household size of 2.4 persons.

Total household water consumption in the UK has risen by 70% over the past 30 years due to a combination of factors including:

- Increasing water using appliance ownership;
- Decreasing occupancy;
- More luxury water-using appliances such as swimming pools and hot tubs;
- Warmer, drier weather.

Increased appliance ownership is thought to account for the majority of increases in household consumption. For example in 1972, only 66% of households owned a washing machine. Ownership increased to 90% by 1996 and is projected to increase further to 94% by 2010.

Decreasing occupancy: Between 1992 and 2001, water consumption per person in households increased by 7% in England and Wales. It is thought that decreasing occupancy accounts for some of this, as smaller household sizes use more water per person<sup>6</sup>.

Luxury water-using appliances: These include 'power' showers, hot tubs and swimming pools, all of which can use very large volumes of water (>100l).

Warmer, drier weather: weather patterns can account for variation in the percentage of abstracted water that is used for public water supply. For example, in 1995, unusually hot dry weather pushed the demand for public water supply up to 52% of total abstracted water.

Household water usage can be broken down into activities. MTP focuses on water using appliances in households, namely, WCs, baths, showers, tapware and white goods.<sup>7</sup> Figure 2.2 shows typical household water use by activity according to a survey of nearly 400 households across England<sup>8</sup>.

Approximately one-third is used for WC flushing. This is decreasing as replacement of older high water-consuming stock is replaced with cisterns meeting the current minimum standard of 6 litres per flush. There is still room for improvement through, for example the use of dual flush WCs and through advances in technology which could bring the required flush volume down still further.

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<sup>5</sup> A Review of water use in UK Industry and Commerce, B Luz, 2005

<sup>6</sup> Frequency of WC flushing is higher in lower occupancy households, along with increased frequency of washing machine use per person and higher bathing frequencies.

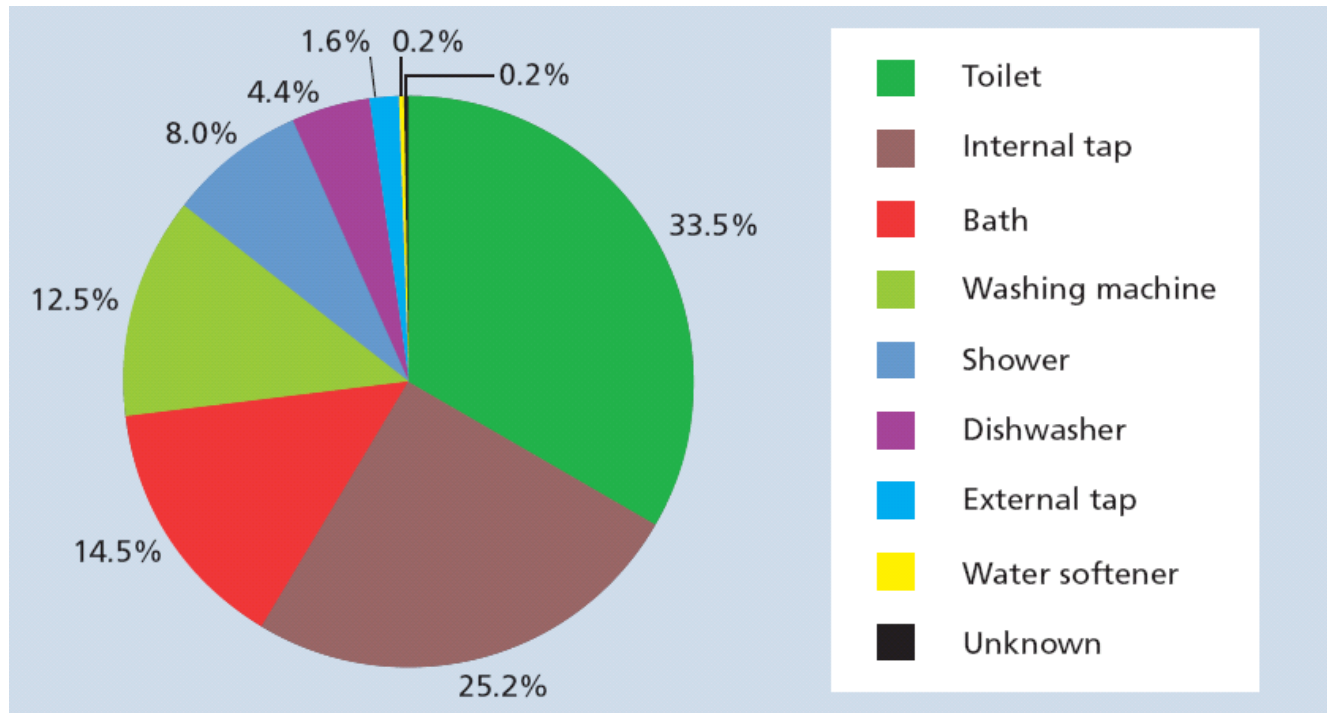
<sup>7</sup> *Security of supply, leakage and the efficient use of water: 2004-05 report*. Ofwat, October 2005.

<sup>8</sup> *Increasing the Value of Domestic Water Use Data for Demand Management - Summary Report*. WRc plc, March 2005 - note that data reflect a study of 400 households covering ten English water companies.

Market Transformation Programme  
**Product Overview: Water**

Water use for personal washing is increasing. The use of luxury water-using appliances such as power showers will contribute to this increase.

**Figure 2.2 Household water use by activity**



## 3 Identified savings potential

### 3.1 Overall savings potential

Saving water has a wide range of economic and environmental benefits. These include:

- Security of supply during periods of low rainfall;
- Lower environmental effects caused by abstraction;
- Maintaining flow conditions in low flow rivers;
- Maintaining acceptable ground source water conditions;
- Maintaining and enhancing biodiversity;
- Reducing carbon emissions related to the treatment and supply of water;
- Monetary savings for the consumer – both domestic and non-domestic.

### 3.2 Domestic sector – the potential for saving

Average household water use is approximately 150 litres per person per day<sup>9</sup>. MTP has identified a total technical savings potential for the household sector of 10% (excluding dishwashers and washing machines)<sup>10</sup>. This is equivalent to the consumption of approximately 1.5 million households (family of four).

The measures identified in policy strategies by MTP would achieve savings of 5% for the domestic sector. Figure 3.1 shows the overall projections for domestic water use to 2020.

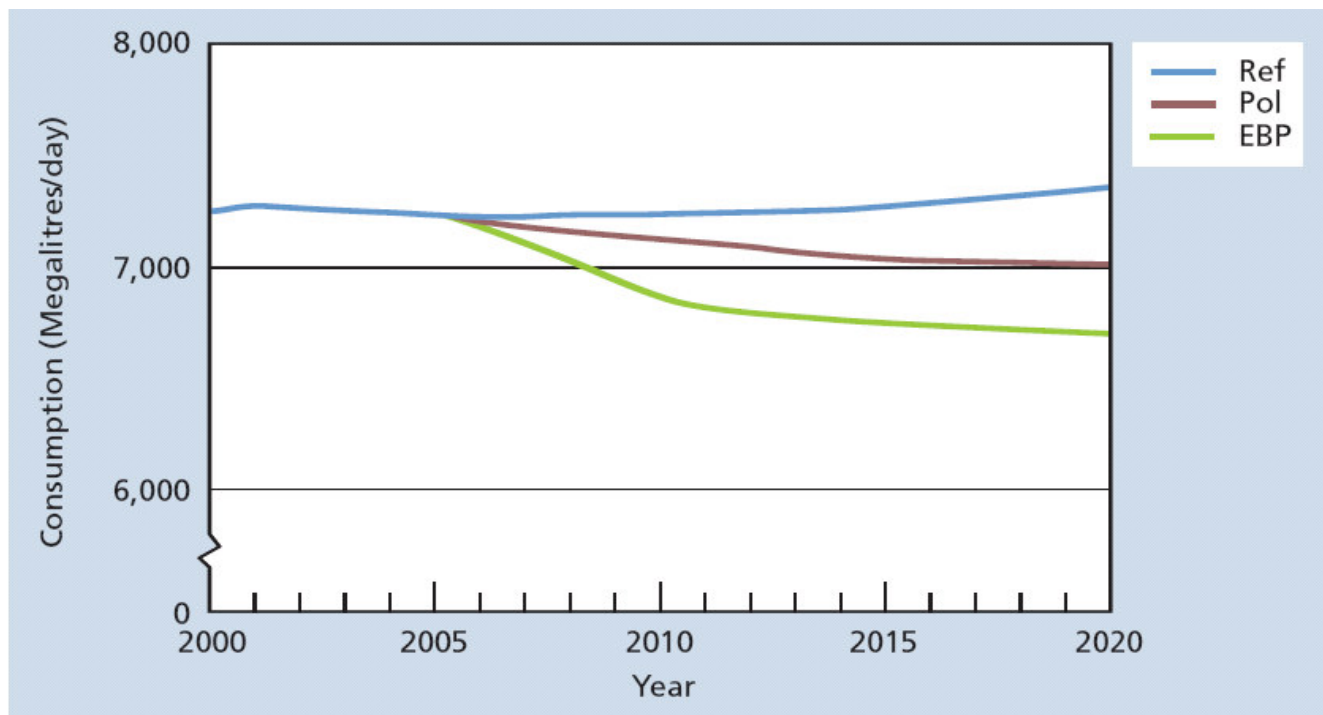
**Table 3.1 Savings potential in the domestic sector**

Product Sector	2020 EBP Saving (ML/day)	2020 Policy Saving (ML/day)
Taps	150	-
Baths	202	47
Showers	143	138
WC's	172	164
Washing machines	0 (Not yet estimated)	-
Dishwashers	0 (Not yet estimated)	-
<b>Total</b>	<b>667</b>	<b>349</b>

<sup>9</sup> *Security of supply, leakage and the efficient use of water: 2004-05 report*. Ofwat, October 2005.

<sup>10</sup> Please note that as the potential savings for dishwashers and washing machines have not yet been estimated, the total technical savings potential has been underestimated as the same consumption figures for this equipment has been used in both the Ref and EBP lines.

Figure 3.1 MTP Ref, EBP and Policy scenarios for domestic water use 2000-2020



**WCs.** There are two main areas with potential to increase water savings:

- Increasing the uptake of 6-litre (and lower) flush WCs (i.e. by promoting low-flush WCs).
- Reducing flush volumes in high-volume cisterns.

Recently, there has been an increase in the number of improved WC suites entering the market, including dual-flush WCs, and single-flush WCs with a flush volume of less than 6 litres. Already on the market are 6/3-litre dual-flush, 4.5-litre single-flush, and 4.5/3 litre dual flush WCs. It is also possible to fit water saving devices, such as retrofit dual flush, and cistern displacement devices into existing stock to reduce flush volumes.

**Taps.** Key opportunities to drive water savings include: reducing water volume flow rates (eg increasing usage of water-saving devices on taps) and reducing the time the tap is left running (eg using automatic shut-off taps in the household sector).

**Showers.** There are three ways in which water savings can be realised:

- Reducing water flow rates of all showers, without causing a change in the 'showering experience';
- Reducing time taken to shower;
- Encouraging a shift away from high flow rate power showers.

**Baths.** Focus is required on the manufacture and uptake of lower volume baths (i.e. less than 200 litres) and also maintaining the current trend of moving away from baths to showers (assuming power shower use is discouraged).

**Dishwashers.** The introduction of the EU Energy Label for dishwashers in 1999 has, indirectly, driven a reduction in the water consumption declared for a 'normally soiled' wash load.

The revalorisation of the EU Energy Label for dishwashers could include a rating for water as this is an aspect that can still differentiate products and where further reductions appear possible. The test method should also take into account the maximum amount of water that autosensing programmes (i.e. programmes which dispense water according to the load weight) could use.

**Washing machines and washer driers.** The introduction of the EU Energy Label for washing machines in 1996 and for washer driers in 1998 has driven a reduction in the water consumption declared for a 60°C cotton programme. Improvements in energy consumption have been achieved by reducing the amount of water heated during the wash phase of the cycle, and reductions in overall water use per cycle has been driven by some major European companies responding to high water costs in countries such as Germany.

The revalorisation of the EU Energy Label for washing machines could include a rating for water consumption if a rinse efficiency test method can be agreed. The revalorisation of the EU Energy Label for washer driers could include a rating for the water used during the drying part of the process. This would allow consumers to more easily compare machines on the basis of total water use.

A future area of focus for MTP shall be to establish how best to learn from the current Energy Labelling scheme so that a Water Product Information Scheme can be developed for water using appliances, such as WCs, to better inform buyers about consumption.

### **3.2 Commercial and industrial water sectors**

MTP has not assessed the potential for water savings in the commercial or industrial sectors.

## 4 Next steps

### 4.1 Priority policies

Currently MTP input is being made to Defra and DCLG on the following water policy documents and issues:

1. **Product information scheme:** Defra is gathering information on the potential for a product information scheme. MTP is gathering evidence to support a business case and is developing suggestions on options for such a scheme. Work is underway by MTP to put forward options to Defra on the potential format, ownership, administration and enforcement of a scheme. Further work is required in this area, especially work with stakeholder representatives including manufacturers.

MTP input could also be made to Defra and DCLG on the following water policy documents and issues:

2. **DCLG Building Regulations Part G (Water conservation and hygiene):** The revision of Part G of the Building Regulations planned to include water efficiency as the Sustainable and Secure Buildings Act allows the Building Regulations to include water efficiency requirements. However, work is currently stalled pending a review of Regulations.
3. **DCLG Mandating Water Efficiency:** A consultation paper is being prepared which will look at the options for voluntary or mandatory inclusion of water efficient measures in buildings.
4. **DCLG Code for Sustainable Homes:** The Code is currently being consulted on. The draft for consultation currently contains several levels of water efficiency requirements for new build.
5. **Defra Water Supply (Water Fittings) Regulations 1999:** Currently minimum performance standards are given for WCs, baths (based on structural loadings), washing machines and dishwashers.
6. **Regional planning documents:** Top level guidance on water savings potential is required at the regional level. This can be built up from an understanding of the water saving potential of water using appliances.

### 4.2 Extending MTP coverage

Within the domestic sector, the intention is to continue work on the priority areas identified: taps, showers, baths and WCs. Work will be focussed on bringing the evidence base for taps in line with that already prepared for other products. Work will focus on emerging

## Market Transformation Programme

### **Product Overview: Water**

technologies, in particular ultra-low flush WCs and recycling showers as these areas have been identified as potentially having the biggest efficiencies made.

MTP shall also be exploring alternative water sources, such as rainwater and wastewater, for use in suitable applications.

MTP will be investigating the potential to apply product policy in the commercial and industrial sectors in 06/07.

There are a number of initiatives underway in commercial and industrial sector, including Defra's Enhanced Capital Allowance Scheme for sustainable water technologies which provides tax relief to businesses investing in certain designated technologies<sup>11</sup> and Envirowise's 'Big Splash'. The Envirowise programme gives guidance on ways to use water more efficiently in commercial and industrial activities. In addition, there is a growing awareness of increasing costs of water consumption and for wastewater disposal which drive water efficiency measures.

Work is already underway to enhance MTP's What-If Tool to present water consumption data in addition to energy consumption data for a wide range of products (see [www.mtprog.com](http://www.mtprog.com)). However, further work is required to establish a more robust evidence base for water use.

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<sup>11</sup> [www.eca-water.gov.uk](http://www.eca-water.gov.uk).

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**Product Overview: Water**

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